FAA Facts

Federal Aviation Administration
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HOW DOES THAT WORK?

CONTROLLING U.S. AIRLINE TRAFFIC

When people hear of the Federal Aviation Administration, they often think of air traffic control. Air traffic control is just one of many functions of the FAA. Approximately 15,000 front-line controllers separate traffic operating under Instrument Flight Rules (IFR) in U.S. airspace.

These controllers are located in a variety of facilities nationwide, including towers, radar rooms (TRACONs) and large en-route centers which control multi-state sections of the US airspace. The real-time activity in these facilities is overseen by the FAA's Air Traffic Control System Command Center, located near Washington, DC.

The primary job of the controller is to maintain a set amount of space between each aircraft. The FAA has very strict standards for aircraft separation.

Controllers can also provide valuable information and assistance to pilots. It is important to note that while controllers offer information, they cannot dictate the ultimate decisions made in the cockpit. In other words, the controller can provide weather or airport information, but, by regulation, the pilot in command has the direct responsibility and is the final authority regarding the operation of that aircraft (14 CFR 91.3).

As an example of how the system works, the following narrative describes a flight departing Chicago O'Hare International Airport and arriving at New York La Guardia Airport. We'll explain how air traffic controllers interact with the flight each step of the way.

Tower Control

Those big towers at local airports look like they control traffic for miles. They do – for about five miles (from the cab). Separate radar facilities, called Terminal Radar Control or TRACONs, may be located in the base of the tower, and can control traffic for another 40 miles or so.

At Chicago O'Hare, the tower cab controls traffic in the immediate area of the airport, and the entire tower building is devoted to supporting the activities in the cab.

The Chicago TRACON is located in Elgin, and it handles traffic for O'Hare, Midway and other Chicago-area airports. Chicago Center, which controls traffic in portions of seven states, is located in Aurora. During a flight, planes will pass from controller to controller and facility to facility within seconds.

At Chicago O'Hare, pilots of passenger and cargo carrying aircraft start their journeys by getting initial weather, load and airport information from their particular airline.

Once a plane is ready to push back from the gate, it will start talking to FAA air traffic control. A series of FAA controllers, located in the tower, will systematically watch and manage the aircraft as it moves from the gate to the taxiway, then toward the runway.

As the plane continues to move across the airport's surface, its pilots will receive more instructions from air traffic control. Pilots must repeat each communication back to ensure it was understood.

Once the appropriate air traffic controller clears a plane for take-off, the flight begins, and within seconds is turned over to the TRACON.

As a general rule, tower controllers manage air traffic within five miles of an airport and at an altitude of less than 3,000 feet.

Approach Control (TRACON)

As the flight ascends over the Chicago suburbs, its pilots talk to controllers located at the Terminal Radar Approach Control (TRACON) facility in Elgin.

The plane continues to work through a systematic series of controllers as it passes through airspace. Each TRACON controller has responsibility for maintaining separation in specifically defined and limited sections of airspace, called a "sector."

The controller monitors his or her sector through a computer screen that displays the flight in real time, along with its flight number, aircraft type, speed and altitude, among other information.

Each sector has a unique radio frequency that the controller uses to communicate with the pilots. As aircraft transition from one sector to another, control responsibility is passed, then pilots are instructed to change to the frequency of the next sector. Visual information automatically passes from one controller's screen to the next.

Generally, TRACON controllers manage aircraft at an altitude of less than 17,000 feet.

The En-Route Center

When the aircraft is 40 miles from O'Hare Airport, it automatically transfers to a controller at the Chicago Air Route Traffic Control Center, located in Aurora.

Aurora is one of 21 Air Route Traffic Control Centers nationwide. These facilities are responsible for the safe and efficient operation of airplanes flying at high altitudes.

FAA en-route controllers use airspace information from long-range radar sites located across the country to manage navigation and communications to more than 100,000 flight operations each day.

Like the TRACON, the Air Route Traffic Control Center's airspace also is split up into smaller, manageable pieces of airspace called "sectors". Sectors have vertical as well as horizontal boundaries.

A few sectors extend from the ground up, but most are stratified, with the lowest sectors defined from the ground to 23,000 feet, and another sector extended above it from 24,000 feet and up. In some cases, a third sector may be defined for 37,000 feet and up.

Controllers working in the facilities' traffic management unit watch the overall flow of traffic and help manage the arrival rate as it comes into the airport. Controllers are also aware of situations at other airports which may require them to hold, divert or delay aircraft.

In-Flight Hand-Offs

On our flight from Chicago to New York, the Chicago Center monitors the aircraft until it approaches the airspace boundary of the Cleveland Air Route Traffic Control Center, located in Oberlin, Ohio.

Cleveland Center then tracks the flight until it reaches the New York Air Route Traffic Control Center's airspace. New York Center monitors the flight until it is within 40 miles of New York La Guardia Airport.

Safe at Home

The aircraft is then handed off to the New York TRACON as it descends and approaches La Guardia Airport and is safely spaced with other arriving aircraft.

The New York TRACON directs the aircraft into position for landing.

When the aircraft is within a five mile radius of La Guardia Airport, it is then transferred to the La Guardia Air Traffic Control Tower. The tower directs the aircraft into position for its final descent, and once the aircraft has landed, Air Traffic Control gives the aircraft taxi instructions to the ramp area near the airport gates.

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